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SYSTEM FOR KEEPING ACCOUNT OF PREDETERMINED HOMOGENEOUS UNITS

This is a continuation, of application Ser. No. 889,517 filed 3/23/78, now U.S. Pat. No. 4,256,955.

FIELD OF THE INVENTION

The present invention relates to credit cards and more particularly to a credit card including at least one unalterable bit field containing a predetermined number of bits in an irreversible state.

SUMMARY OF THE INVENTION

An object of the invention is to provide a recording or transaction medium capable of recording whole numbers of units. The medium is used to note and keep a record of data involved in transactions which take place to verify or check that the holder of an article can perform an operation prior to an operation which has been requested. The applications are many; they may, for example, be to record jobs done (in time or units) or to record quantities of goods or services supplied or received (for example by connection to a volume counter) and so on, with a view either to paying in or paying out or more simply for easy and reliable record keeping.

Because the most obvious applications of the invention are for payment of goods or services where the handling of cash or transferable money is eliminated, for greater clarity the remaining description of the invention relates to situations where payments equivalent to cash payments and not specific to an individual are made. The reader will realize that the medium which forms the subject of the invention may equally well be made specific to an individual in various fashions (by the imprinting of a name or confidential code or a key which enables a confidential code to be checked with a view to authorizing access) or may be used in situations which do not necessarily involve the movement of money in one direction or another.

To this end, an object of the invention is to provide an article for keeping account of predetermined homogeneous units, wherein the article carries information to be coupled to an external means for imprinting and/or operating on the said information. The article incorporates a memory and circuits for controlling the memory.

The article is temporarily coupled to the external imprinting and/or operating means, which reads data from and writes data into the memory of the article.

The article memory contains three types of coded information, viz.:

(1) an identification of the use for which the article is intended,

(2) the identity of the units used to keep account of the operations which are performed, and

(3) the number of units available to the holder of the article.

The imprinting and/or operating means writes into the article memory the number of units required or received by the holder of the article, within the limits of the capacity of the memory, and/or reduces the number of units by the number of units received or required by the holder of the article.

In the context of a case where, for example, the invention is applied to the supply of services or goods, such as telephone calls, postage stamps, etc., the user obtains an article, such as a card, in exchange for pay-

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ment in cash or transferable money of a sum corresponding to the total amount of the goods or services required. The user obtains the card from a given point, depending upon the nature of the goods or services required. At the point where the card is purchased, the total amount is recorded in coded language on the card as a number of equal and separate units.

The card may or may not be made "bearer only," that is, it may or may not be personalized, but it may only be used in connection with apparatus provided for the purpose of the purchase.

The card is very simple to use because it need merely be inserted into an operating apparatus associated with the particular services or goods. The card and the apparatus must be compatible and the number of service or goods units required must not exceed the number of units available on the card.

When the above criteria have been satisfied, the required services of goods are supplied, resulting in cancellation of a certain number of the available units on the card. The credit on the card is thus debited by a quantity corresponding to the sum of the service or goods supplied. The card, once exhausted, can no longer be used and is returned by the user when a fresh card is purchased. The memory of the card is incapable of reuse once completely decremented, that is, once all of the available units imprinted at the time of purchase have been competely used.

Preferably, for security purposes, all or some of the information recorded in the memory is coded in an unalterable code in which each type of information is expressed in a field of n binary bits. M of the n bits in the field can be irreversibly changed after being initially imprinted, where m is less than or equal to n and is fixed in advance.

With such coding, any interference, i.e., tampering with the coded information, can result only in binary configurations which are meaningless to the operating apparatus of the invention.

The above and still further objects, features and advantages of the present invention will become apparent upon consideration of the following detailed description of one specific embodiment thereof, especially when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram of a layout of the information content of an article according to the invention;

FIG. 2 is a logic diagram of circuits carried by the article;

FIG. 3 is a more detailed logic diagram of part of the circuitry of FIG. 2;

FIG. 3a is a detailed logic diagram of part of the circuitry of FIG. 2;

FIG. 4 is a logic diagram of a means for imprinting data into a memory of the article;

FIG. 5 is a logic diagram of a means for using the article;

FIG. 6 is a schematic view of part of the means for imprinting and using the article;

FIG. 7 is a logic diagram of means for checking the article;

FIG. 8 is a diagram of the means for supplying power to the article;

FIG. 9 is a logic diagram of a means for performing dialogues between the machine of FIG. 4 and the article;